

CLAIMS

WHAT IS CLAIMED IS:

1. A device for extracting bodily fluid, the device comprising:
a penetration member, the penetration member having a channel and being configured for penetrating a target site and subsequently residing within the target site and extracting a bodily fluid sample therefrom; and
a fluid flow regulator disposed within the channel of the penetration member, the fluid flow regulator adapted to reduce bodily fluid flow rate through the penetration member.
2. The device of claim 1, wherein the fluid flow regulator is further adapted to minimize bodily fluid flow rate variation through the penetration member.
3. The device of claim 1, wherein the fluid flow regulator is further adapted to optimize a dead volume of the device.
4. The device of claim 1, wherein the penetration member is configured for penetrating a dermal tissue target site and extracting an interstitial fluid sample therefrom.
5. The device of claim 1, wherein the channel has an inner diameter in the range 100 μm to 500 μm .
6. The device of claim 1, wherein the fluid flow regulator includes a narrow-bore channel and wherein a diameter of the narrow-bore channel is less than a diameter of the channel.
7. The device of claim 6, wherein the narrow-bore channel has a diameter in the range of 5 μm to 150 μm .
8. The device of claim 6, wherein the narrow-bore channel has a gradually decreasing diameter.
9. The device of claim 6, wherein the narrow-bore channel has a diameter that decreases in a stepped manner.

10. The device of claim 6, wherein the diameter of the channel of the penetration member is approximately 300 μm and the narrow-bore channel has a width of 12 μm and a height of 15 μm .

11. The device of claim 1, further including a coating on at least one surface of the fluid flow regulator selected from the coating group consisting of non-thrombogenic coatings and anti-thrombogenic coatings.

12. The device of claims 1 or 3, wherein the penetration member and the fluid flow regulator are formed as an integral unit.

13. The device of claim 1, wherein the penetration member is formed of stainless steel and the fluid flow regulator is formed of a polymer.

14. The device of claim 13, wherein the fluid flow regulator is formed of a polymer with non-thrombogenic properties.

15. A method for extracting bodily fluid from a target site, the method comprising:

providing a device for extracting bodily fluid that includes:

a penetration member, the penetration member having a channel and being configured for penetrating a target site and subsequently residing within the target site and extracting a bodily fluid sample therefrom; and

a fluid flow regulator disposed within the channel of the penetration member, the fluid flow regulator adapted to reduce bodily fluid flow rate through the penetration member;

penetrating the target site with the penetration member; and
extracting bodily fluid from the target site.

16. The method of claim 15, wherein the extracting step extracts ISF from the target site.